

SPALLATION NEUTRON SOURCE PROJECT EXECUTION PLAN

APPENDIX B

DOE-ORO PROJECT MANAGER PLANS AND CONTROLLED ITEMS

The contents of this PEP section are under the purview and control of the DOE-ORO project manager, who must approve and sign all changes.

APPENDIX B

SPALLATION NEUTRON SOURCE PROJECT EXECUTION PLAN

DOE-ORO PROJECT OFFICE PLANS AND CONTROLLED ITEMS



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DOE Manager

August 4, 2000

<u>Changes Since August 4, 2000</u>	<u>Level</u>	<u>Approval</u>	<u>Date in PEP</u>
BCP-01-SNS-001 1:1 Klystron per Cavity	2	Price 10/27/00	4/16/01
BCP-01-SNS-002 Conventional Facilities	2	Price 10/19/00	4/16/01
BCP-01-SNS-003 March Re-baseline	2	Price 3/27/01	4/16/01

SPALLATION NEUTRON SOURCE PROJECT EXECUTION PLAN

1. INTRODUCTION

This Appendix B of the Spallation Neutron Source Project Execution Plan supplements the base document and Appendix A by providing additional detail on management and execution of the SNS project. Level 2 baselines (technical, schedule, and cost) controlled by the DOE Project Manager are identified along with the thresholds for application of formal change control processes. Changes to this appendix are at the sole discretion of the DOE Project Manager, although all revisions are provided to the Program Manager and Acquisition Executive.

The PEP is the primary reference document for all project management and control processes. Technical requirements, policies, procedures, procurements, budgeting and finance, work authorization, management, reporting, reviews and evaluations, etc., flow down from the PEP.

2. MISSION NEED AND JUSTIFICATION

See Sect.2, Mission Need and Justification, of the Project Execution Plan.

3. PROJECT DESCRIPTION

The SNS will consist of a full-energy linac, producing a 1-GeV H-beam, with at least 1-mA average beam current. The high-energy particles are compressed by stacking them into an accumulator ring. The accumulated beam is diverted in a single turn ($<1\text{-ns}$) onto a liquid-metal (mercury) target, producing a burst of neutrons. These neutrons are slowed in four moderators (two ambient and two cryogenic), and the resulting thermal and cold neutrons are transported to neutron scattering instruments where research measurements are performed. Up to 18 beam ports will be available in the target station, which will operate with pulses at a repetition rate of 60 Hz.

4. MANAGEMENT SYSTEMS

4.1. Intersite Office Coordination

An SNS partnership has been established with six laboratories to execute the SNS project. Periodic administrative functions will be required by the DOE site offices at each of the participating labs. These functions include items such as financial allocations, procurement package reviews and approvals, incorporation of “performance measures” in the laboratory contract, etc. Implementing these activities will require some portion (anticipated as relatively small) of site office personnel, and it is the ORO SNS project manager’s desire to have these collective responsibilities focused at a single working level point of contact. The person serving as the point of contact for each site will be kept abreast of project activities at his or her site and will gain overall project information through participation in the semiannual

SC project reviews. The ORNL Site Manager and the ORO SNS Project Manager will establish and maintain an understanding with the five other DOE site offices regarding these efforts. A copy of the documented understanding is attached to this appendix of the PEP.

4.2. Organization and Responsibilities

The DOE Project Manager leads a project office with a dedicated full-time staff to oversee and direct project activities and relies on part-time ORO matrix staff for supplemental support. The matrix personnel resources are provided primarily through staff assignments from various ORO organizations. A summary ORO organizational diagram for the SNS project is given in Figure B-1. The DOE Project Manager is responsible for overseeing the prime contractor (UT-Battelle, LLC.) effort to design, procure, and construct the SNS facility within approved baselines.

Also, with multiple DOE laboratories involved in the project, the DOE Project Manager has established a Memorandum of Agreement between ORO and the local DOE office for each participating laboratory. This agreement defines the roles, responsibilities, and expectations of the local offices needed to support the SNS project effort.

4.3 Work Breakdown Structure

The project work breakdown structure (WBS) is controlled by the SNS project team. The DOE project manager will be notified of WBS level 3 changes in structure and associated cost plans.

4.4 Acquisition Strategy

4.4.1 Prime Contractor

DOE is acquiring design, construction, and operation of the SNS through an M&O contractor, currently UT-Battelle, LLC. This contract is administered by ORO with authority for SNS activities delegated to the DOE Project Manager. Appropriate performance measures will be maintained in the M&O contract to promote effective management and completion of the SNS project. Similarly, working through the DOE site offices at the collaborating laboratories, appropriate performance measures will be incorporated into those M&O contracts too.

4.4.2 Subcontractor(s)

To the extent possible, SNS will endeavor to apply performance-based and/or fixed-priced contracting concepts for executing the project. Standard practice will be for SNS and its subcontractors to have available budget authority to cover, at a minimum, the first increment of work (first year, first deliverable, contract base period, etc.,) to be performed under the subcontract before initiating the procurement process. Exceptions to this standard practice, such as initiating procurement of the AE/CM before line item project start, will be addressed on a case-by-case basis.

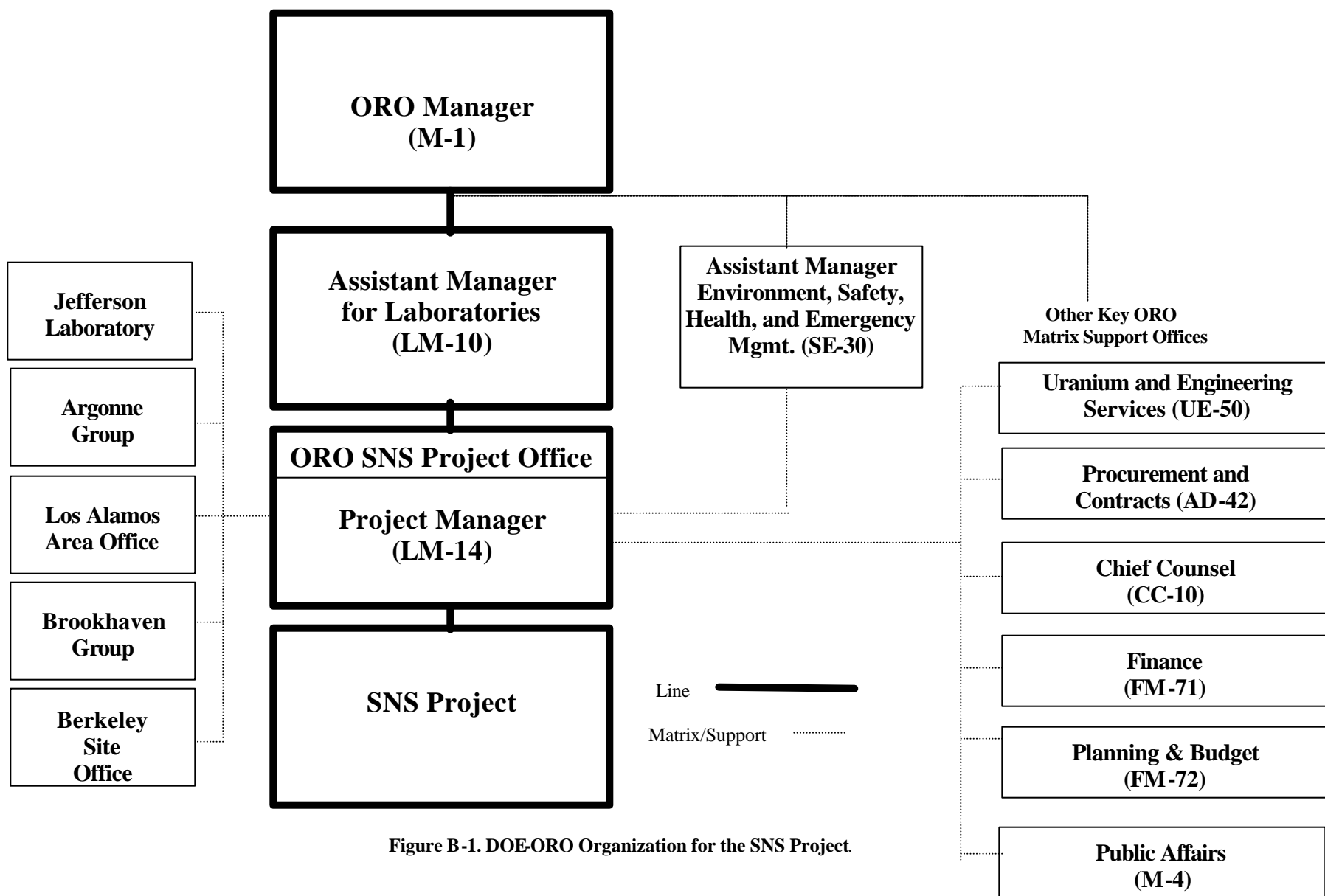


Figure B-1. DOE-ORO Organization for the SNS Project.

4.4.3 Small and Disadvantaged Businesses

Efforts will be made to encourage participation of Small and Disadvantaged Businesses (SDBs) in execution of the SNS project. The scale and technical complexity of the SNS effectively preclude SDBs from principal roles; therefore, the focus will be on identifying smaller packages of work that match the capabilities of these firms and soliciting their involvement. Where feasible, targets/goals for SDB participation will be included in management agreements and contracts with the major project participants.

4.5. Work Authorization

The DOE project manager will issue project directives to SNS authorizing work. These directives will define the specific work authorized for execution by the contractor and will specify the project funds available for project activities. Revised directives will be issued when new work phases or activities are to begin and when incremental funds are authorized.

4.6 Project Schedules

Four levels of DOE-controlled milestones are planned that relate to change control approval levels.

- Level 0:** DOE Acquisition Executive controlling project critical decisions and completion of the NEPA process (the EIS Record of Decision).
- Level 1A:** DOE Director, Office of Science (SC) controlling major milestones leading to completion of the project.
- Level 1B:** DOE Associate Director, Office of Basic Energy Sciences (BES) controlling key work phase completion milestones.
- Level 2:** DOE project office (ORO) controlling the start and finish dates for selected project system (WBS level 2) activities.

The level 2 milestones are listed in Section 8.3, which provides descriptions of each milestone.

4.7 Baselines and Controls

An essential element of project management systems is control of changes to the project baselines defined in this PEP. This objective is carried out through a hierarchy of change control boards, with progressively structured authority for approval and disapproval of changes. The four DOE board levels are:

- Level 0:** DOE Acquisition Executive
- Level 1A:** Director, Office of Science (SC)
- Level 1B:** Associate Director, Office of Basic Energy Sciences (BES)
- Level 2:** DOE Field Project Manager at ORO

The SNS project baselines controlled by DOE-ORO are listed in Sect. 8 of this appendix, “Project Baselines and Change Control Thresholds.”

4.8 Financial Management

4.8.1 Definitions

4.8.1.1 Total Estimated Construction Cost (TEC)

Budgets for the SNS project will delineate the project total estimated construction cost (TEC) as the anticipated capital costs directly associated with design and construction of the facility. The TEC includes design, construction, equipment and its installation and associated management, contingency, and escalation. These costs typically require project specific congressional authorization.

4.8.1.2 Other Project Costs (OPCs)

Budgets for the SNS project will delineate other project cost (OPC) associated with expenditures (expense and capital equipment) required to support the capital effort (design and construction) to the point of turning the facility over for routine operation. OPC includes conceptual design, research and development required to support the design, NEPA documentation, preoperational costs, facility commissioning, and associated management and escalation. These costs do not typically require project specific congressional authorization, but they have a direct relationship to the capital costs for which congressional authorization is typically required.

4.8.1.3 Total Project Cost (TPC)

$TPC = TEC + OPC$.

4.8.1.4 Semiannual Estimate To Complete

Twice per year, in preparation for the DOE-HQ program office semiannual project review, a critically assessed estimate of the cost to complete the project will be prepared.

4.8.1.5 Annual Operating Cost

Updated annual operating cost estimates will be generated each year of the project.

4.8.1.6 Life Cycle Cost

An estimate of the project life-cycle costs was developed using information derived from the facility design as documented in the Conceptual Design Report. Costs are escalated to 2006 and are in constant dollars thereafter. Life-cycle cost is estimated as follows.

\$ 1.41 Billion	TPC
+ 4.27	+ {Annual operating cost x Design Lifetime}
<u>+ 0.14</u>	<u>+ D&D cost estimate</u>
\$ 5.82 Billion	= Life-Cycle cost

4.8.2 Budget Allocation

Appropriated funds will be distributed to SNS through approved financial plans reflecting work authorized by project directives. SNS will, in turn, distribute necessary budgets to the other participant laboratories.

4.8.3 Contingency

Contingency provides a source of “performance measurement budget” for allocation to project work activities and a source of “funds” to cover anticipated cost growth in planned activities as the knowledge base for activities grows. Contingency for the SNS project is derived based on the perceived technical risk associated with each activity (i.e., contingency for “known unknowns”). Technical risk corresponds to the cost of developing or modifying system components sufficient to meet performance specifications and the cost for schedule impacts associated with the extended development or modification process. Contingency is not included in the TPC for external factors (unknown unknowns) such as changes caused by new regulations or for annual funding shortfalls (appropriation less than baseline funding level). When such circumstances or events occur, they will be treated as “directed changes” requiring work-around plans and new or additional schedule and budget allowances. The amount of project contingency is the difference between the baseline TEC and the minimum direct estimated cost for completing line item work in accordance with the Integrated Project Schedule.

DOE will authorize annual appropriations to the prime contractor through project directives. The project team will control distributions of the project contingency unless change controls thresholds as set forth in Sect. 8 are exceeded.

All project allocations for contingency will be documented through the formal change control process.

4.8.4 Performance Measurement

Accrued actual cost for work performed (ACWP) and progress [earned value or budgeted cost for work performed (BCWP)] on the SNS project will be reported using a project-wide reporting and controls system, with routine reporting to DOE at WBS level 2. Project performance data will be tracked against baselines, variance analyses will be performed, and needed corrective actions will be taken. Corrective action plans will be prepared and submitted to change control boards commensurate with predetermined thresholds. Variance thresholds establish the limits beyond which formal explanations are required internally and in official reports to DOE. The project control system will be operational throughout the life of the project.

4.8.5 Cost Collection

Actual cost (invoices and cost transfers) for work performed on the SNS project will be accumulated using appropriate accounting procedures and systems.

4.9 Quality Assurance

A project quality assurance (QA) program in accordance with DOE Order 414.1, *Quality Assurance*, and Title 10, *Code of Federal Regulations*, Part 830.120 (10 CFR 830.120) will be implemented, where applicable, within the first year of the project. The contractor shall develop a project QA plan, submit the plan to the DOE project manager for approval, and then implement the plan throughout the project. Revisions to the QA plan will be submitted to the DOE project manager for approval.

4.10 Project Monitoring and Assessment

Real-time monitoring of the SNS project will occur through routine interface among project participants; however, periodic formal meetings and reviews will be conducted to document project status and action items. The DOE project manager will maintain awareness of project activities and status through the following:

Co-location with contractor: The DOE project manager and staff will co-locate with the SNS team managing the project. This will foster real-time communication of issues and promote expeditious resolution.

Monthly project status meeting: The DOE project manager reviews progress since the previous meeting, configuration control activity, and project issues.

Configuration control board: As required, the DOE project manager reviews contractor proposed changes and provides approval or rejection.

4.11 Performance Reporting

The SNS project team will issue the following project reports:

1. Project status report: The project status report to be issued each month will contain the following information.
 - The DOE Project Manager’s overview and assessment of the project.
 - The SNS Project Director’s overview and assessment of the project.
 - A narrative describing the status of technical work, significant project accomplishments, and problems. Pictures will be included when appropriate.
 - A milestone schedule and status report to WBS level 2. All DOE-controlled, plus an assortment of other non-controlled, milestones will be included in this report. In general, the report will address the status of approximately 25 to 30 milestones in any given year, with at least 1 milestone for each WBS level 2 element.
 - Cost performance reports at WBS level 2.
 - Format 1 – WBS
 - Format 2 - Organizational/functional
 - Format 3 – Baseline} *or equivalent*
 - An explanation of variances to plan (refer to the Project controls document for variance reporting thresholds).
 - Critical path analysis report.

The SNS project organization will integrate all participants’ input into the report, which will be issued by the end of the month following the reporting month (example: a March activity report will be available by the end of April).

2. Project technical reports: Project technical reports will be issued to document special topical items.
3. Project procurement status reports: The project procurement status report will be updated and issued monthly and will provide the status of major subcontracts and material procurements.
4. Annual OMB A-11 Report: Annually submit a report consistent with the format of OMB A-11, Part 300B.

4.12 Public Relations/Participation

Public involvement in the SNS project will occur in three ways:

1. EIS public meetings: In compliance with the NEPA process, scoping meetings to help identify issues that need to be addressed in the EIS, public hearings to receive comments on the draft EIS, and public hearings to receive comments on the draft EIS were held. Any EIS supplement or supplemental analyses will be shared with the local government and community.
2. Tennessee State oversight: Periodic information briefings will be held with the state oversight office for Oak Ridge. Project status and planning are presented to the oversight staff who represent the public in the areas of public safety and the environment.
3. Ad hoc activities: Throughout the life of the project, contacts are made with DOE and ORNL by public bodies (news media, professional societies, interest groups, local government committees, etc.) seeking information about the project. The project team will be responsive to the needs and desires of these organizations by arranging on-site meetings, visiting their forum, or other appropriate means.

5. ENVIRONMENT, SAFETY AND HEALTH

5.1 NEPA Compliance

A final EIS addressing the impacts for constructing and operating the SNS at a preferred location in Oak Ridge, Tennessee and at alternate locations at Argonne, Illinois; Brookhaven, New York; and Los Alamos, New Mexico; was issued on April 23, 1999. Subsequently, on June 18, 1999, the Secretary of Energy issued a Record of Decision to proceed with construction and operation of the SNS at the Oak Ridge location. A mitigation action plan (MAP) designed to reduce or eliminate important impacts on the Oak Ridge area has been drafted and was shared with the local community before being finalized. Any revisions of the MAP will likewise be shared with the local community.

5.2 Plant Safety and Evaluation

The project will implement an Integrated Safety Management System approach to project and facility safety. A primary objective of the SNS project is to protect the environment and the safety of workers and the general public. This will be accomplished through (1) understanding potential hazards, (2) designing the facility to appropriately mitigate potential hazards, (3) developing operational controls for hazards that cannot be eliminated through design features, and (4) operating the facility in accordance with prescribed limits and procedures.

The majority of the SNS facility falls in the category of “low-hazard accelerator facility,” but the target building is a “nuclear facility” based on the anticipated radionuclide inventory. As such, safety evaluations will be graded for the applicable category. The safety evaluation process for the overall SNS facility will be governed by the work smart standards agreement of July 24, 1996, and a safety assessment document (SAD) will be prepared. The target building will be evaluated as a nuclear facility, and a safety analysis report (SAR) will be prepared. The DOE-ORO Project Manager will approve the preliminary and final SAR and the final SAD.

Operating procedures and manuals will be developed to define the accelerator safety envelope (ASE) for operations. This ASE will address safety issues raised by the safety evaluation process and the attendant actions, systems, controls, etc., required to mitigate the hazards during facility operation.

5.3 Waste Minimization and Pollution Prevention

Available programs, checklists, and models developed to assist in comprehensive minimization and management of waste generation, handling, and disposal will be employed.

5.4 Permitting and Licensing

An objective of the SNS project is to minimize the risk of cost increases and schedule delays associated with permitting and licensing processes. Permitting requirements will be defined early in the project, technical information needed for permit application will be developed in a timely manner, and completed applications will be filed at times supporting the project schedule. Appropriate applications will be filed with local, state and federal agencies for such things as air quality, water quality, solid waste disposal, transportation, air navigation obstructions, etc.

5.5 Construction and Industrial Safety

The contractor shall compile an appropriate listing of environment, safety, and health (ES&H) standards from existing work smart standards for construction activities. The construction manager (CM) will be required to develop and implement a construction safety program in accordance with these standards. The CM will strictly and vigorously enforce safety rules. Both the DOE Project Manager and senior SNS contractor management will provide independent inspection and assessment of safety program implementation.

6. RESOURCE PLANNING

6.1 Project Personnel

The DOE-ORO project office will have a peak staff of approximately five directly assigned individuals. This office will be supplemented by part-time matrix support from other ORO organizations, estimated at a full-time equivalent (FTE) of approximately 2.

6.2 Operating Cost Estimate

Updated figures will be included in annual data sheet submissions.

6.3 Decontamination and Decommissioning Cost Estimate

An approximation of decontamination and decommissioning (D&D) cost for the SNS are developed in a manner similar to other current DOE strategic system projects. The cost is estimated as 10% of the project TEC (without contingency); plus a 50% contingency on that value. This is anticipated to include removal of reusable/valuable equipment and materials, target and other activated materials, contaminated process fluids and waste materials, and D&D of remaining building structures.

7. TRANSITION TO OPERATIONS

Before project completion and the beginning of plant operations (CD-4), a readiness assessment will be performed. The review team will consist of knowledgeable and independent individuals who will assess the programmatic and safety readiness of the facility for operation.

8. PROJECT BASELINES AND CHANGE CONTROL THRESHOLDS

DOE-ORO PROJECT MANAGER'S CONTROLS																																																					
	BASELINE (level 2)	CHANGE THRESHOLD																																																			
TECHNICAL SCOPE	Preliminary and final safety documents Quality assurance plan	Changes to level 2 baselines																																																			
SCHEDULE	Schedule milestones as specified in Sect. 8.3 of this appendix	Delays > 3 months to level 2 milestones																																																			
COST	WBS Level 2 Cost Summary <table> <tr> <th></th><th>WBS Level 2</th><th>\$ Million</th></tr> <tr> <td>1.2</td><td>Project Support</td><td>76.0</td></tr> <tr> <td>1.3</td><td>Front End</td><td>19.3</td></tr> <tr> <td>1.4</td><td>Linac Systems</td><td>260.9</td></tr> <tr> <td>1.5</td><td>Ring & Transfer Systems</td><td>146.6</td></tr> <tr> <td>1.6</td><td>Target Systems</td><td>93.3</td></tr> <tr> <td>1.7</td><td>Instrument Systems</td><td>60.0</td></tr> <tr> <td>1.8</td><td>Conventional Facilities</td><td>306.4</td></tr> <tr> <td>1.9</td><td>Integrated Control Systems</td><td>58.1</td></tr> <tr> <td colspan="2">TEC subtotal w/o contingency</td><td>1,020.6</td></tr> <tr> <td colspan="2">Contingency</td><td><u>172.1</u></td></tr> <tr> <td colspan="2">Total Estimated Cost, TEC</td><td>1,192.7</td></tr> <tr> <td>1.1</td><td>Research and Development</td><td>68.5</td></tr> <tr> <td>1.10</td><td>Pre-Operations</td><td>115.8</td></tr> <tr> <td colspan="2">Prior year costs</td><td><u>34.7</u> (FY 96–98)</td></tr> <tr> <td colspan="2">Other Project costs, OPC total</td><td>219.0</td></tr> <tr> <td colspan="2">Total Project Cost, TPC</td><td>1,411.7</td></tr> </table>		WBS Level 2	\$ Million	1.2	Project Support	76.0	1.3	Front End	19.3	1.4	Linac Systems	260.9	1.5	Ring & Transfer Systems	146.6	1.6	Target Systems	93.3	1.7	Instrument Systems	60.0	1.8	Conventional Facilities	306.4	1.9	Integrated Control Systems	58.1	TEC subtotal w/o contingency		1,020.6	Contingency		<u>172.1</u>	Total Estimated Cost, TEC		1,192.7	1.1	Research and Development	68.5	1.10	Pre-Operations	115.8	Prior year costs		<u>34.7</u> (FY 96–98)	Other Project costs, OPC total		219.0	Total Project Cost, TPC		1,411.7	Any increase to TEC or TPC The smaller cumulative change of \geq \$10 Million or 50% to a WBS level 2 costs.
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8.1 Safety Assessment and Requirements

The SNS will be designed, constructed, and operated in such a manner to protect the safety of workers, the public, and the environment.

Radiation protection will be governed by the “Necessary and Sufficient” standards agreement of July 24, 1996, which includes 10 CFR 835, “Occupational Radiation Protection.”

8.2 Quality Assurance

A project QA program will be governed by DOE Order 414.1, *Quality Assurance*, and 10 CFR 830.120, “Quality assurance requirements,” where applicable.

8.3 Schedule Milestones

MILESTONE DESCRIPTION	MILESTONE DATES
WBS 1.2—PROJECT SUPPORT	
<i>Safety:</i>	
1. Issue PSAD for information	9/00 (A)
2. Submit PSAR to DOE for approval	12/99 (A)
3a. Issue FSAD for approval (Front End & Linac)	9/02
3b. Issue FSAD for approval (HEBT, Ring, & RTBT)	2/04
4. Issue FSAR for approval	8/05
WBS 1.3—FRONT END SYSTEMS	
<i>Design:</i>	
5. Design complete	5/01
<i>Construction:</i>	
6. Begin equipment installation	9/02
7. Front end beam available to linac*	3/03
WBS 1.4—LINAC SYSTEMS	
<i>Design:</i>	
30. Initiate testing of prototype cryomodule	5/02
8. Design complete*	9/02
<i>Construction:</i>	
9. Begin equipment installation	9/02
10. Linac beam available to ring*	5/05
WBS 1.5—RING SYSTEMS	
<i>Design:</i>	
11. Design complete	10/03
<i>Construction:</i>	
12. Begin equipment installation	3/03
13. Ring beam available to target*	11/05
WBS 1.6—TARGET SYSTEMS	
<i>Design:</i>	
14. Design complete*	6/03
<i>Construction:</i>	
15. Begin equipment installation	6/03

*Also Level 1 milestones.

MILESTONE DESCRIPTION	MILESTONE DATES
WBS 1.7—INSTRUMENT SYSTEMS	
<i>Design:</i>	
16. Design complete*	10/04
<i>Construction:</i>	
17. Begin Equipment Installation	12/03
18. Complete Acceptance Test	6/06
WBS 1.8—CONVENTIONAL FACILITIES	
<i>Construction:</i>	
19. Begin site preparation	3/00 (A)
<i>Beneficial Occupancy:</i>	
20. Front end building	12/02
21. Linac tunnel*	4/03
22. Ring tunnel*	8/03
23. Target building	12/04
24. Construction of Conventional Facilities Complete	11/05
WBS 1.9—CONTROL SYSTEMS	
<i>Design:</i>	
25. Design complete	1/03
<i>Construction:</i>	
26. Begin equipment installation	10/02
27. Complete acceptance test	5/06
WBS 1.10—OPERATIONS	
<i>Operations:</i>	
29. Complete project acceptance test*	6/06

*Also Level 1 milestones.

Milestone Definitions

Level 2

1. PSAD Submitted to DOE – Defined as the completion of the Preliminary Safety Assessment Document and issuance to DOE for information. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the project office to DOE ORO.
2. PSAR Submitted to DOE – See Level 1B, Milestone 2.
3. FSAD Submitted to DOE - Defined as the completion of the Final Safety Assessment Document and issuance to DOE for approval. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the project office to DOE ORO.
4. FSAR Submitted to DOE - Defined as the completion of the Final Safety Analysis Report and issuance to DOE for approval. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the project office to DOE ORO.
5. Front End Design Complete – Defined as completion of the Front End final design review. Completion of this milestone will be awarded upon the issuance to the project office of a memorandum from the accelerator division manager stating the completion of the final design review and his or her concurrence and acceptance of the design package.
6. Front End Begin Equipment Installation – Milestone is defined as the first sub-project equipment installed in their associated facility building. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Front End STL and the accelerator division director.
7. Front End Beam available to Linac – see Level 1B Milestone 6.
8. Linac Design Complete - See Level 1B, Milestone 3
9. Linac Begin Equipment Installation – Milestone is defined as the first sub-project equipment installed in their associated facility building. This would exclude any equipment required for the Front End commissioning. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Linac STL and the accelerator division director.
10. Linac Beam available to Ring – See Level 1B Milestone 9.
11. Ring Design Complete - Defined as completion of the Ring final design review. Completion of this milestone will be awarded upon the issuance to the project office of a memorandum from the accelerator division manager stating the completion of the final design review and his or her concurrence and acceptance of the design package.

12. Ring Begin Equipment Installation – Milestone is defined as the first sub-project equipment installed in their associated facility building. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Ring STL and the accelerator division director.
13. Ring Beam available to Target – See Level 1B, Milestone 10
14. Target Design Complete - See Level 1B, Milestone 7
15. Target Begin Equipment Installation – Milestone is defined as the first sub-project equipment installed in their associated facility building. This would include the installation of the shield blocks in the target core area. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Target STL and the experimental division director.
16. Instrument Systems Design Complete - See Level 1B, Milestone 8
17. Instrument Systems Begin Equipment Installation – Milestone is defined as the first sub-project equipment installed in their associated facility building. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Instrument Systems STL and the experimental division director.
18. Instrument Systems Complete Subproject Acceptance Test – Milestone is defined as the completion of 3 instruments installed and tested. This milestone will be complete upon notification of the project office via memorandum from the target division director and the experimental division director that this condition exists.
19. Begin Site Prep – Defined as the beginning of site work to include initial tree harvesting and access road construction. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Conventional Facilities division director.
20. Front End BOD – Defined as the date on which Beneficial Occupancy of the Front End building is transferred from conventional facilities to the Accelerator Division. Completion of this milestone will be granted upon the notification to the project office by the Front End STL and the accelerator division director that the facility has passed their walk through.
21. Linac Tunnel BOD – See Level 1B, Milestone 4
22. Ring Tunnel BOD – See Level 1B, Milestone 5
23. Target BOD – Defined as the date on which Beneficial Occupancy of the Target building is transferred from conventional facilities to the Experimental Facilities Division. Completion of this milestone will be granted upon the notification to the project office by the Target STL and the experimental division director that the facility has passed their walk through.
24. Conventional Construction Complete – Defined as all conventional facility construction is complete. At this point, any facility issues will be handled by maintenance. Completion of this milestone will be granted upon the notification to the project office by the division director that the facility has passed their walk through.

25. Global Controls Design Complete - Defined as completion of the Global Controls hardware final design review. Completion of this milestone will be awarded upon the issuance to the project office of a memorandum from the accelerator division manager stating the completion of the final design review and their concurrence and acceptance of the design package.
26. Global Controls Begin Equipment Installation – Milestone is defined as initiation of installation of the Front End control system and the Front End portion of the personnel protection system. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Global Controls STL and the accelerator division director.
27. Global Controls Complete Project Acceptance Test – Defined as the completion of the Global controls acceptance test for the Target Sub-project. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Global Controls STL and the accelerator division director.
28. Deleted
29. Complete Project Acceptance Test - See Level 1A, Milestone 6
30. Prototype cryomodule is assembled and installed in the test area, ready to begin connecting cryogenics, electrical, vacuum and rf power inputs. Milestone complete will be achieved upon the issuance of a memorandum to the project office from the Jlab STL.

U.S. DEPARTMENT OF ENERGY MEMORANDUM OF AGREEMENT ^{1/}

between

**OAK RIDGE OPERATIONS OFFICE
SPALLATION NEUTRON SOURCE PROJECT OFFICE**

and the

**ARGONNE GROUP,
BERKELEY SITE OFFICE,
BROOKHAVEN GROUP,
JEFFERSON LAB SITE OFFICE,
and
LOS ALAMOS AREA OFFICE**

I. Introduction

Neutrons are a unique and increasingly essential tool in broad areas of the physical, chemical, and biological sciences, as well as in materials technology and nuclear medicine. The Spallation Neutron Source (SNS) Project is to provide a next-generation short-pulse spallation neutron source to meet this scientific need, and it is estimated that design/construction of the SNS facility will take just over 7 years (FY 1999-2006) with a Total Project Cost of \$1.36 billion.

The SNS Project is a Strategic System initiative of the Office of Science (SC), with specific Program Direction under the purview of the Office of Basic Energy Sciences (BES). Oak Ridge Operations Office (ORO) has been delegated field management responsibility for the project, and is executing the project through the Oak Ridge National Laboratory (ORNL) Management and Operating (M&O) contractor, currently Lockheed Martin Energy Research Corporation (LMER). In turn, ORNL has distributed design-fabricate responsibilities for system technical components among a five laboratory partnership:

Ion Injector	Lawrence Berkeley National Laboratory (LBNL)
Linac	Los Alamos National Laboratory (LANL)
	Thomas Jefferson National Accelerator Facility (JLab)
Ring	Brookhaven National Laboratory (BNL)
Target	Oak Ridge National Laboratory (ORNL)
Experiment	Oak Ridge National Laboratory (ORNL) and
Systems	Argonne National Laboratory (ANL)

^{1/} This revision adds JLab as the 6th partner, extends this support agreement to the DOE Jefferson Lab Site Office, and updates the DOE Oak Ridge Project Manager.

II. Scope

This Memorandum of Agreement (MOA) formalizes the mutual agreement among the DOE offices responsible for overseeing the partner laboratories executing the SNS Project. It represents the agreement by the signatory DOE offices to support the Department's mission to construct a new neutron research facility, the SNS, by holding their respective contractors accountable for safe, environmentally-benign, high-quality, and cost-effective performance on all assigned project work. The signatories commit to making necessary resources available to effectively oversee contractor performance on the SNS, and to facilitate project procurements, staffing actions, and other administrative activities required for their contractor's timely performance of SNS work.

III. Provisions

The ORNL SNS Project Office is coordinating project work among the five participating laboratories, and DOE is responsible for administering the M&O contracts for each of these laboratories. ORO has direct responsibility for ORNL contractor performance and leadership responsibility for organizing project support from the cognizant DOE offices having contract performance responsibilities for the other four participant laboratories. This MOA provides the framework for DOE Field Office oversight and coordination of the partner laboratories' efforts to design, construct, install, and commission the SNS facility. All funding for this work is being provided by SC/BES, through ORO, to ORNL for execution of the SNS project. Subsequent funds transfers from ORNL to the participant laboratories is processed through the host DOE offices. Details for managing the SNS project are contained in the Project Execution Plan (PEP), which will include this MOA as well as a similar contractor MOA among the five partner laboratories.

Signatories to this MOA commit to expeditiously support execution of the SNS project by

1) maintaining cognizance of their respective laboratory's role, closely monitoring performance on SNS project work, and communicating with ORO, particularly to promptly notify ORO of any significant issues; 2) by establishing appropriate SNS project performance expectations in their laboratories' M&O contracts, and holding their contractors accountable under the terms of those contracts; and 3) by performing administrative duties required of the local DOE office to facilitate contractor execution of the project.

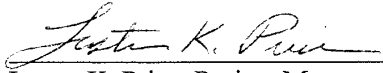
IV. MOA Implementation

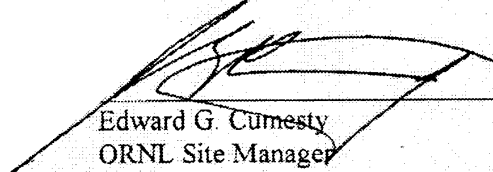
ORO has established an SNS Project Office to administer overall project execution and to coordinate DOE inter-office support for the project. Other cognizant DOE offices (Argonne Group, Berkeley Site Office, Brookhaven Group, Jefferson Lab Site Office, and Los Alamos Area Office) will have a local DOE Project Lead, with support as necessary, to monitor and promote contractor performance on the project. The Project Lead will continue to report administratively to the local DOE Manager, but will functionally report to the ORO SNS Project Office for communicating project information and to receive guidance regarding beneficial areas for local involvement. Current and/or potential duties for the Project Lead include:

- Including SNS project performance measures (recommended annually by the ORO SNS Project Office) in their M&O contract;
- Taking prompt corrective actions with their respective M&O contractor as required and requested by the ORO SNS Project Office;
- Assigning end-of-year SNS performance ratings to the contractor based on the past year's performance against the agreed upon performance measures (input to be provided by the ORO SNS Project Office);
- Authorizing contractor SNS work under the M&O contract;
- Providing oversight and direction to assure project performance;
- Assess contractor performance:
 1. Provide monthly assessment to the SNS Project Manager; and
 2. Support local contractor performance assessment process
- Participating in semi-annual SC project reviews (approximately 5 days each);
- Expediting local approvals for contractor procurements;
- Facilitating contractor staffing actions;
- Ensuring project funds allocated to the site (Financial Plan or inter-laboratory) are expended against approved work scope; and
- Review all project change proposals affecting the site.

V. ASSISTANCE REQUEST

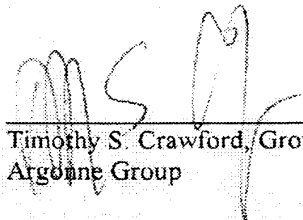
Your support for execution of the SNS project in accordance with the provisions of this Memorandum of Agreement is hereby requested.

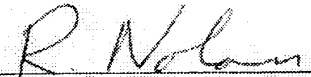

Lester K. Price, Project Manager
Spallation Neutron Source
5/12/00
(Date)



Edward G. Cúmesy
ORNL Site Manager
6/2/99
(Date)

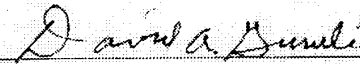
VI. AGREEMENT

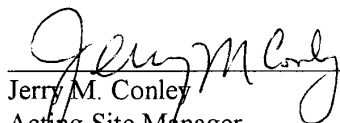
We the undersigned agree to support execution of the SNS project in accordance with the provisions of this Memorandum of Agreement.



Timothy S. Crawford, Group Manager
Argonne Group
7/9/99
(Date)


Richard H. Nolan, Manager
Berkeley Site Office
6/15/99
(Date)


George J. Malosh, Executive Manager
Brookhaven Group
(Date)


David A. Gurule, Area Manager
Los Alamos Area Office
6/8/99
(Date)


Jerry M. Conley
Acting Site Manager
Jefferson Lab Site Manager
5/23/00
(Date)


Albert E. Whiteman, Assist. Manager
Office of Technology and Site Programs
Albuquerque Operations Office
6/9/99
(Date)